tion of the vessel could not be given, but has lately been obtained by Mr. W. C. Devereaux, Assistant Observer at Havana, Cuba, and the record is here published as given by the captain of the *Jason*.

Date.	Hour.	Latitude, north.	Longitude, west.
		° ′	° ′
August 14.....	4 a. m....	22 29	95 43
14.....	8 a. m....	22 33	95 18
14	12 noon...	22 35	95 5
14.....	4 p. m....	22 35	94 59
14.....	8 p. m....	22 36	94 52.5
14.....	9 p. m ...	22 36	94 51
14.....	10 p. m....	22 41	94 47
14.....	12 midn't	22 49	94 42
15.....	4 a. m....	23 0	94 34
15.....	8 a. m....	23 4	94 25
15.....	12 noon...	23 7	94 19

CONDITION OF THE OCEAN.

An agreement has been entered into between the United States Weather Bureau, the United States Hydrographic Office, and the Director of the Meteorological Service of the Azores, Capt. François S. Chaves, in accordance with which all reports as to the condition of the ocean, all local meteorological data, and all information regarding derelicts, wrecks, and icebergs will be cabled immediately to the Weather Bureau, for which purpose the ocean cable service between Horta and New York is free up to a limit of thirty words daily. Copies of all such reports will be transmitted immediately by the Weather Bureau to the Hydrographic Office and to all other interested parties.

PATHS OF STORM CENTERS.

A recent number of the Register and Leader, Des Moines, Iowa, January 24, contains an article by Mr. H. A. Campbell, of that city, elucidating the general principle that storm centers or centers of low pressure move in quite regular paths across the American Continent, and that these paths are located farther north or south from time to time. A given region, such as Iowa, may for months together lie entirely south of the paths, and therefore enjoy mostly clear, pleasant, or dry weather; while at other times the paths of the storms pass over the region in rapid succession, and give it a long rainy season.

After the long drought of 1901 the belt embracing the paths of the lows moved farther to the south. After June 10, 1902, this belt was about 1200 miles wide, and 60 lows were recorded in it between June 11 and September 1, while only two were south of the Great Lakes and entirely out of the belt.

From September 18, 1903, to January 14, 1904, Mr. Campbell finds the great majority of storms confined within this same general belt. When storms move from west to east within this belt, only light rains, or perhaps entire droughts, occur in Iowa or other States south of the line from New York, N.Y., to Victoria, Vancouvers Island.

During the summer of 1894 an unprecedented drought prevailed in Iowa, while the belt within which the storm paths occurred lay far to the north, stretching from east to west across British America. There were many storm paths in that region, but none far enough south to bring rain to Iowa.

All modern weather bureaus base their forecasts on the daily weather map, and all monthly weather reviews or annual summaries show the paths that storm centers have pursued as they moved over the surface of the globe. As far back as 1872 it was the custom in the Weather Bureau for the forecaster who went off duty at the close of any month to explain to the one who relieved him that recent maps had shown that the general movement of the centers of low pressure was faster or slower and farther north or farther south, as the case might be, so that the incoming official could make a proper allowance for this variation in his daily forecasts. In the MONTHLY WEATHER REVIEW, beginning with January, 1873, it began to be the custom to call attention to the fact that the average latitude of the paths of low pressure had, during a given month, been somewhat to the north or south, east or west of their usual position. In a general chart showing the average frequency of storm tracks, compiled by the Editor for the statistical atlas of the Census Bureau in 1874, it was shown that the belt of greatest frequency seemed to pass centrally over our Lake region, and thence eastward to Newfoundland. Finally, in 1893, in Weather Bureau Bulletin A, or "Summary of International Meteorological Observations," there are given charts compiled by Professor Garriott showing the average and principal storm tracks and storm frequency, month by month, over the whole Northern Hemisphere. The belt of greatest storm frequency extends from near Sitka southeastward to Duluth, thence eastward to St. Johns, Newfoundland.

This belt may be said to begin in the Philippines. It extends east-northeast over Japan and the Aleutian Islands before reaching Sitka. It also extends from New Foundland eastward to the mid-Atlantic, after which it branches southeastward to France and Turkey, and northeastward to Norway, Sweden, northern Russia, and Siberia, where it seems to be lost. Possibly more perfect weather charts of central Asia would enable us to trace this belt around the globe, but there is some reason for believing that it really does come to an end, and that general storms are infrequent in northern China and Siberia, although local rains must occur. The average movement of storms along this great belt is variable; many of them of course die out entirely, but others soon take their place. During the ten years, 1878–1887, for which Mr. Garriott's charts hold good, the velocity of progress of the strom centers within this belt of greatest frequency varied from seven miles an hour in one portion of the belt during the month of April, to thirty-seven miles an hour in another portion in January and February. The average eastward velocity for all storms and portions of the belt was 22 miles per hour, but the average within the United States was 30 miles per hour; over the North Atlantic Ocean, 20 miles; over Europe, 18 miles; over Japan, 23 miles; over Bering Sea and the Aleutian Islands 20 miles; along the coast of Alaska, 18 miles.

All storms that begin in the northern trade wind region move westward and slowly northward, until they have entered the region of westerly winds, latitude 25° or 30°, after which they move northeastward until they enter the belt of greatest storm frequency. The average motion westward during the first part of their course is 23 miles per hour; the average motion eastward is about twenty-two miles per hour, according to Professor Garriott's tables.

The path of greatest storm frequency seems to coincide with the average dividing line or boundary between regions of cold northerly and warm southerly winds. It also coincides nearly with the trend of the isobars at 3 miles above the earth's surface, but the speed of movement of the storm center has nothing to do with the speed of the lower wind as it blows around that center. It may possibly have some connection with the general speed of the upper currents of air, as they blow around the polar region in connection with the isobars at the 3-mile or some other upper level. It may, therefore, be approximately true that the upper air blows eastward with an average velocity over the North American portion of this belt of 30 miles per hour throughout the year. This may be equivalent to saying that in the latitude of 50° north the layer of air that determines the movement of the storm centers, provided we think of them as drifting along with that layer, must be moving at such a rate that it passes from longitude 140° west eastward to longitude 50° west, that is to say, one quarter of the way around this small circle of latitude in about five and one-half days.

At latitude 50°, one degree of the small circle of latitude is 44.552 statute miles. Therefore, 90°, or one-quarter of the circle, is 4009.7 miles. At the rate of 30 miles per hour, this would be described in 133.7 hours, or five days and fourteen hours, and the whole circle would be described in twenty-two days and eight hours. On the other hand, if the storm centers are supposed to follow the wind and the isobars at about 3 miles above the earth's surface, as shown in the MONTHLY WEATHER REVIEW for November, 1896, Chart VII, or in Professor Bigelow's Report on International Cloud Observations, charts 40 and 43, then, owing to the oval form of these isobars, the track may be somewhat shorter than the small circle, and the time of describing the oval may be seventeen days. In general the daily weather predictions depend upon evidence as to what the storm center's path will be. Sometimes we can look ahead several days and see that storms will pass far to north or south, but the rules governing their average paths are not yet worked out satisfactorily.

THE WEATHER OF THE MONTH.

By Mr. W. B. STOCKMAN, District Forecaster, in charge of Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and VI.

The mean monthly barometric pressure was high over the Rocky Mountain and Pacific districts, northern Missouri Valley and North Dakota, with the crest over portions of the middle and northern Plateau regions, the maximum mean pressure for the month being 30.30 inches at Boise, Idaho. The mean pressure was low over southern Florida, northern New England, and the northeastern portion of the upper Lake region. The minimum mean pressure was 30.02 inches at Eastport, Me.

The mean pressure was above the normal from Mexico and the western portion of the coast of Texas northward and northwestward to the Canadian boundary of Idaho and Washington, and westward to the Pacific Ocean; also in North Dakota, the upper Lake region, New England, Middle Atlantic States, and northern portion of the South Atlantic States; in all other districts it was below normal. The greatest excess of pressure ranged from +0.15 inch to +0.19 inch, and occurred in the north and middle Pacific districts. The greatest deficiency in pressure ranged from —0.06 inch to —0.08 inch, and occurred in Montana.

The mean pressure increased over that for December, 1903, in the Pacific districts south of Washington, in southwestern Arizona, northern part of the South Atlantic States, Middle Atlantic States, New England, Lake region, northern portions of the upper Mississippi and Missouri valleys, and North Dakota; elsewhere the mean pressure showed a decrease.

The greatest increase in pressure occurred over New England, northern portion of the Middle Atlantic States, eastern lower Lake region, and northern upper Lake region. The greatest decrease was reported from the northern and middle slope and Plateau regions.

TEMPERATURE OF THE AIR.

The distribution of maximum, minimum, and average surface temperatures is graphically shown by the lines on Chart V.

By geographic districts the temperature was above normal in the west Gulf States, Missouri Valley, and the northern and middle slope, northern Plateau and Pacific regions, and below normal in the remaining districts. The plus departures were very marked in the northern slope and northern Plateau regions, as were the minus departures in the Atlantic States and Lake region.

East of the Mississippi River the departures generally averaged from —4.0° to —8.7° per day, the greatest daily deficiency occurring over the mountain districts of New York and Pennsylvania. Over the northern Plateau, northern slope, and northern portions of the middle slope and middle Plateau regions the mean daily departures ranged from +4.0° to +12.3°, the departure increasing from the southern portion of the area northwestward, the maximum departures occurring over north-central Montana.

The isotherms of 60° and 50° of mean temperature did not differ much from their location in January, 1903; 40° and 30° lay somewhat to the southward; east of the Mississippi 20° and 10° lay considerably to the southward; and an isotherm of zero mean temperature, of which there was none in January, 1903, included northern Minnesota, and northeastern North Dakota.

The isotherms of maximum and minimum temperature over the eastern half of the country, as a rule, lay well to the southward of their location in January, 1903.

The average temperatures for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	8	19.0	— 6.0		
Middle Atlantic	12	26.1	— 6.1		
South Atlantic	10	41.4	— 4.7		
Florida Peninsula*	8	57.7	— 2.0		
East Gulf	9	45.4	— 3.0		
West Gulf	7	47.1	+ 0.5		
Ohio Valley and Tennessee	11	30.4	— 3.9		
Lower Lake	8	18.6	— 6.7		
Upper Lake	10	12.2	— 5.3		
North Dakota*	8	4.3	— 1.0		
Upper Mississippi Valley	11	17.5	— 3.6		
Missouri Valley	11	20.9	+ 1.0		
Northern Slope	7	24.0	+ 6.5		
Middle Slope	6	30.9	+ 1.9		
Southern Slope*	6	38.2	— 0.7		
Southern Plateau*	13	36.8	— 0.1		
Middle Plateau*	8	24.6	— 1.4		
Northern Plateau*	12	31.0	+ 5.6		
North Pacific	7	41.6	+ 2.4		
Middle Pacific	5	48.0	+ 1.0		
South Pacific	4	52.2	+ 1.6		

*Regular Weather Bureau and selected voluntary stations.

In Canada.—Prof. R. F. Stupart says:

The temperature was below the average from the western portion of Lake Superior to the Maritime Provinces and very much below in many localities, especially in the Georgian Bay district, the lower Lake region and the Ottawa and upper St. Lawrence valleys, where the negative departures ranged from 5° to 12°. In the Maritime Provinces the departure was from 3° to 5°, and in Quebec from 1° to 5°. British Columbia was generally just the average, while from the Rocky Mountains east to Lake Superior the temperature was everywhere above the average, Manitoba giving a positive departure of 3° to 4°, and the Territories from 3° to 9°, the maxima positive departures occurring in Alberta and southwestern Assiniboia.

PRECIPITATION.

The distribution of total monthly precipitation is shown on Chart III.

The precipitation was normal in the upper Mississippi Valley, and southern slope region; above normal in the Florida Peninsula, and lower Lake region; and below normal in the remaining geographic districts. The most marked departures occurred in the Florida Peninsula, west Gulf States, and the middle and south Pacific districts.

Over central and northern Florida the excess ranged from 2.0 to 4.0 inches, the greatest occurring on the west-central